

# Geothermal Energy Project Brief

California Energy Commission

June 2002

## San Bernardino Geothermal District Heating System

### PURPOSE

Provide heating and domestic hot water to customers in the City of San Bernardino, California using geothermal resources.

### FUNDING AND OWNERSHIP

The City of San Bernardino Water Department owns and operates the geothermal system. The California Energy Commission provided co-funding for construction in the form of grants and loans.

Grants to the City of San Bernardino	\$ 134,425
Loans to the City of San Bernardino	2,512,900
Grants to the County of San Bernardino	146,840
Loans to the County of San Bernardino	1,811,245
Match funds, City of San Bernardino	\$ 539,250
Match funds, County of San Bernardino	785,312
<b>TOTAL</b>	<b>\$5,929,972</b>

### GEOHERMAL RESOURCE AND SYSTEM DESIGN

The geothermal system serves 21 buildings, including the City Hall, the County Detention Center, the San Bernardino Sun, and the Radisson Hotel. Most of the customers are larger users, although some small buildings are connected. This geothermal district heating system is one of the largest in the world.

Geothermal fluids are pumped from two geothermal wells, each about 1000 feet deep and provide fluids at temperatures of about 128 degrees F. Typically, to better manage resources, the wells are used one at a time and are cycled every 12 hours. The system uses an average of 1500 gallons per minute (GPM), but up to 2150 GPM is available, if needed.

There are 18 miles of pipeline, most of which is ductile iron pipe with a foam and PVC insulating jacket, which the Water Department designed. The temperature loss is about 1 degree F per mile of insulated pipeline.

After the heating system use, the exceptionally clean 98 degree F fluids are discharged into the sanitary sewer and city storm drain systems, eventually flowing into the local flood plain, in which the fluids are absorbed into the earth. There is 24-hour monitoring of the discharge.

### SAVINGS AND PAYBACK PERIOD

The annual savings to the customers are between 25%-45%, compared to natural



# Geothermal Energy Project Brief

California Energy Commission

June 2002

gas costs. Geothermal system customers are protected from the uncertainty and fluctuations in natural gas prices. The average payback period for new customers who connect to the geothermal system is two to three years.

**For more information on this project, contact:**

**William B. Bryden, Director**  
**San Bernardino Municipal Water Dept.**  
**(909) 384-5096**  
**[http:// www.ci.san-bernardino.ca.us](http://www.ci.san-bernardino.ca.us)**

**Elaine Sison-Lebrilla**  
**California Energy Commission**  
**1516 Ninth Street, MS-43**  
**Sacramento, CA 95814-5504**  
**(916) 653-0363**

**Gray Davis, Governor**  
**Mary D. Nichols, Secretary for Resources**

CALIFORNIA ENERGY COMMISSION

**William J. Keese, Chairman**  
**Robert Pernell, Commissioner**  
**Arthur Rosenfeld, Commissioner**  
**James D. Boyd, Commissioner**  
**John L. Geesman, Commissioner**  
**Steve Larson, Executive Director**

